

WHAT IS CLAIMED IS:

1. A wireless communication system for determining a plurality of uplink modulation schemes and a plurality of downlink modulation schemes for use in a wireless communication system including a base station and a plurality of customer premises equipment (CPE), where each of the plurality of uplink and downlink modulation schemes used by each of the plurality of CPE can be asymmetric, such that the uplink modulation scheme may be different than the downlink modulation scheme, the system comprising:

a plurality of CPE, each including a first modem configured to measure a first link quality based on received downlink data;

a base station having a second modem configured to measure a second link quality for each of the plurality of CPE based on received uplink data;

a first processor configured to receive the first link quality and determine a downlink modulation scheme for each of the plurality of CPE; and

a second processor configured to receive the second link quality and determine an uplink modulation scheme for each of the plurality of CPE.

2. The system of Claim 1, wherein the first processor is located at each of the plurality of CPE.

3. The system of Claim 1, wherein the first processor is located at the base station to receive the first link quality from each of the plurality of CPE.

4. The system of Claim 1, wherein the second processor is located at the base station.

5. The system of Claim 1, wherein the second processor is located at each of the plurality of CPE to receive the second link quality from the base station.

6. The system of Claim 1, wherein the first modem includes a signal to noise ratio module configured to measure the first link quality.

7. The system of Claim 1, wherein the first modem includes a bit error rate module configured to measure the first link quality.

8. The system of Claim 1, wherein the second modem includes a signal to noise ratio module configured to measure the first link quality.

9. The system of Claim 1, wherein the second modem includes a bit error rate module configured to measure the first link quality.

10. A wireless communication system for determining an uplink modulation scheme and a downlink modulation scheme for use in a wireless communication system including a base station and at least one customer premises equipment (CPE), wherein the uplink and downlink modulation schemes are independently determined, such that the uplink modulation scheme may be different than the downlink modulation scheme, the system comprising:

a CPE having

a first modem configured to measure a first link quality based on received downlink data,

a first processor configured to receive the first link quality and determine a downlink modulation scheme for the CPE; and

a base station having,

a second modem configured to measure a second link quality for the CPE based on received uplink data,

a second processor configured to receive the second link quality and determine an uplink modulation scheme for the CPE.

11. A wireless communication system for selecting a plurality of modulation schemes for use with a base station and a plurality of customer premises equipments (CPEs), wherein physical slots in an uplink subframe of data are assigned to the plurality of CPEs by the base station, and wherein the plurality of modulation schemes are used by the plurality of CPEs to modulate data transmitted during the physical slots to the base station, the system comprising:

a plurality of CPEs, each including a first modem configured to measure a quality value for a first physical slot of a first downlink subframe of data and transmit the quality value during a subsequent first physical slot of a first uplink subframe of data; and

a base station including a second modem configured to receive each quality value from the plurality of CPEs and determine a modulation scheme for a second physical slot of a second downlink subframe of data for each of the plurality of CPEs, wherein the downlink modulation scheme is determined independently of a modulation scheme for a second physical slot of a second uplink subframe of data.

12. The system of Claim 11, wherein the base station further includes a processor configured to determine the modulation scheme for the second physical slot of the second downlink subframe of data.

13. The system of Claim 11, wherein the first modem includes a signal to noise ratio module configured to measure the quality value for the first physical slot of the first downlink subframe based on at least one signal to noise ratio measurement.

14. The system of Claim 11, wherein the first modem includes a bit error rate module configured to measure the quality value for the first physical slot of the first downlink subframe based on at least one bit error rate measurement.

15. A wireless communication system for determining a first and second uplink modulation scheme and a first and second downlink modulation scheme for use in a wireless communication system including a base station and a first and second customer premises equipment (CPE), wherein the first uplink and downlink modulation schemes may be different, and the second uplink and downlink modulation schemes may be different, the system comprising:

a first CPE configured to receive data that is modulated using a first downlink modulation scheme by a base station and including a first signal to noise ratio module configured to measure a first downlink quality for the received data, and a first processor configured to determine a revised first downlink modulation scheme based on the first downlink quality;

a second CPE configured to receive data that is modulated using a second downlink modulation scheme by the base station and including a second signal to noise ratio module configured to measure a second downlink quality

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for the received data, and a second processor configured to determine a revised second downlink modulation scheme based on the second downlink quality;

a base station having a third signal to noise ratio module configured to measure a first uplink quality for the received data from the first CPE and a second uplink quality for the received data from the second CPE, and a third processor configured to determine a first uplink modulation scheme based on the first uplink quality for the first CPE and a second uplink modulation scheme based on the second uplink quality for the second CPE.

16. A wireless communication system for determining a plurality of uplink modulation schemes and a plurality of downlink modulation schemes for use in a wireless communication system including a base station and a plurality of customer premises equipment (CPE), wherein each of the plurality of uplink and downlink modulation schemes used by each of the plurality of CPEs can be asymmetric, such that the uplink modulation scheme may be different than the downlink modulation scheme, the system comprising:

a plurality of CPEs, each of the CPE including a first modem configured to measure a first downlink quality for data from a base station; and

a base station having a second modem configured to measure uplink quality for transmissions from each of the plurality of CPEs, and a processor configured to determine an uplink modulation scheme for each of the CPE, wherein the processor is further configured to receive the first downlink quality from the plurality of CPEs and determine a downlink modulation scheme for each CPE.

17. The system of Claim 16, wherein the first modem includes a signal to noise ratio module.

18. The system of Claim 16, wherein the first modem includes a bit error rate module.

19. A method for determining a plurality of uplink modulation schemes and a plurality of downlink modulation schemes for use in a wireless communication system

which communicates with frames of data and includes a base station and a plurality of customer premises equipment (CPEs), wherein each of the plurality of uplink and downlink modulation schemes used by each of the plurality of CPEs can be asymmetric, such that the uplink modulation scheme may be different than the downlink modulation scheme, the method comprising:

determining an uplink quality for a first frame of data transmitted by a CPE and received by a base station;

comparing the determined first uplink quality to a plurality of modulation threshold values;

if the first uplink quality has crossed one of the plurality of modulation thresholds selecting a second uplink modulation scheme for the CPE;

receiving a request for the second uplink modulation scheme at the CPE;

determining a downlink quality for a second frame of data transmitted by the base station and received by the CPE;

comparing the determined first downlink quality to a second plurality of modulation threshold values;

if the first downlink quality has crossed one of the plurality of modulation thresholds, selecting a second downlink modulation scheme for the CPE;

receiving a request for the second downlink modulation scheme at the base station;

transmitting a third frame of data by the base station to the CPE using the second downlink modulation scheme;

transmitting a fourth frame of data by the CPE to the base station using the second uplink modulation scheme.

20. The method of Claim 19, wherein determining the uplink quality is accomplished using at least one signal to noise ratio ("SNR") measurements for the first frame of data.

21. The method of Claim 20, wherein the at least one SNR measurements are averaged in order to determine the uplink quality.

22. The method of Claim 19, wherein determining the downlink quality is accomplished using at least one signal to noise ratio ("SNR") measurements for the second frame of data.

23. The method of Claim 22, wherein the at least one SNR measurements are averaged in order to determine the downlink quality.

24. The method of Claim 19, further comprising sending the selected second uplink modulation scheme by the base station to the CPE within an uplink frame map.

25. The method of Claim 19, further comprising sending a request for the selected second downlink modulation scheme by the CPE to the base station.

26. The method of Claim 25, further comprising sending a confirmation by the base station to the CPE in response to the request for the second downlink modulation.

27. The method of Claim 25, further comprising recognizing the second downlink modulation in the third frame of data by the CPE.